

## End Cap

### Description

[0001] The invention relates to an end cap for a housing of a door closer according to the generic part of patent claim 1.

[0002] An end cap according to the generic part of patent claim 1 consists of a plate-shaped cap housing which is formed flat and is mounted on the open end surfaces of the door closer's housing, as such housings usually have a rectangular cross-section.

[0003] However, the structure of such constructions is relatively heavy and therefore, for visual reasons, a drawback when used with stylish door constructions.

[0004] Therefore, it is an object of the present invention to provide an end cap of the type indicated in the generic part of patent claim 1, the cap housing thereof allowing to create a visually more appealing door closer housing form.

[0005] This object is solved by the features of patent claim 1.

[0006] As an advantage resulting therefrom, a housing of a door closer equipped with the inventive end cap will have an overall slimmer and a more stylish conception, which is

applicable to a plurality of door constructions in a visually advantageous manner.

[0007] Advantageous further developments of the invention are set forth in the dependent claims.

[0008] Hereinafter, embodiments of the invention will be explained based on the drawings, in which:

[0009] Figure 1 shows a perspective, slightly simplified illustration of a door closer, the housing thereof being provided with one inventive end cap respectively at the end sides,

[0010] Figure 2 shows a sectional illustration of the door closer according to Figure 1,

[0011] Figure 3 shows a side elevation of a first embodiment of an inventive end cap,

[0012] Figure 4 shows an inside view of a cap housing of the end cap according to Figure 1,

[0013] Figure 5 shows a sectional illustration of the end cap according to Figures 3 and 4,

[0014] Figure 6 shows a sectional illustration of an end area of the door closer according to Figure 1, the end cap being mounted,

[0015] Figure 7 shows an illustration of the door closer, corresponding to Figure 6, in an alternative embodiment of the inventive end cap, and

[0016] Figures 8-12 are illustrations corresponding to Figures 6 and 7 of further embodiments of the inventive end cap.

[0017] According to Figure 1 a door closer 3 is illustrated which has a housing 2. As depicted in Figure 1, the end sides of the door closer's 3 housing 2 are provided with one end cap 1 respectively. When combining the views of Figures 1 and 2, it is illustrated in this case that the end caps 1 are suitably connected to the housing 2 of the door closer 3, as will be explained hereinafter.

[0018] Hereinafter, a first embodiment of an inventive end cap 1 will be explained in detail based on Figures 3 to 5.

[0019] The end cap 1 has a cap housing 4, which, according to the illustration in Figure 4, is provided with an attachment device 5.

[0020] Figures 3 and 5 show that the cap housing 4 has a convexly curved end wall 6.

[0021] Furthermore, Figure 4 reveals that, in the illustrated embodiment, the cap housing 4 further has two convexly curved lateral walls 7 and 8. The combined view of

Figures 3 to 5 shows that this convex shape of said walls results in a very stylish and slim embodiment of the cap housing 4.

[0022] In the embodiment illustrated in Figures 3 to 5, the cap housing 4 moreover has a covering wall 9, which is disposed at the top, is flat and integrally connected to the end wall 6 and the lateral walls 7 and 8. As a result, the cap housing 4 has a form which is particularly easy to manufacture.

[0023] Furthermore, Figures 4 and 5 reveal that in this example the attachment device 5 is formed as an insert connection, which attachment device 5, in the embodiment illustrated in Figures 3 to 5, has an insert flange 11. Starting at the covering wall 9, the insert flange 11 protrudes into the inner space 10 of the cap housing and has an inside contour I, the shape thereof matching the corresponding counter-surface of the housing 2 of the door closer 3. It is explicitly referred to the illustration in Figure 4 where the inside contour I is disclosed. Figures 4 and 5 reveal in this case that in the illustrated embodiment the insert flange 11 is integrally connected to the covering wall 9.

[0024] Figure 6 represents an enlarged illustration of the left end cap 1 of Figure 2 in order to explain how this embodiment is attached at the housing 2. Figure 6 shows in

this case, that a screw plug 17, having a retaining slot 18, is mounted in the opening of the housing 2. The insert flange 11 of the attachment device 5 of the end cap 1 will engage in this retaining slot 18, thus reliably fixing the end cap 1 at the housing 2 without the risk of loosing it and allowing that it be removed as well.

[0025] Figures 6 and 7 further reveal that in the area of the surface 19, a counter-surface 20 is provided, which in relation to an outer contour 23 of the housing 2 is recessed by at least the thickness of the wall of the covering wall 9 of the end cap 1. This offset in the outside housing contour of the housing 2 achieves a seamless transition between the housing 2 and the end cap 1. Thus, projecting butt joints in the transition area between the end cap 1 and the beginning of the housing 2 are eliminated. At the same time an effective tolerance compensation is provided to compensate for manufacturing tolerances of both the housing 2 and the end caps 1. Furthermore, a visible gap between the end cap 1 and housing 2 is eliminated.

[0026] Figure 7 represents an enlarged illustration of the right end cap according to Figure 2. This embodiment has an alternative attachment device 5' that is formed as an adherend 19 on the underside of the covering wall 9. This adherend 19 is glued to the corresponding counter-surface 20 of the housing 2 by means of a suitable adhesive, which is

apparent from the diagrammatically simplified illustration in Figure 7.

[0027] Further embodiments of the end cap 1 are illustrated in Figures 8 to 12, which include alternatives for the structure of the attachment device 5 or 5'.

[0028] In this case, Figures 8 to 10 show an attachment device 5' which in the case of Figure 8 has a single inside adherend 14 at the covering wall 9. This illustration substantially corresponds to the one of Figure 7.

[0029] In Figures 9 and 10 an attachment device 5' is provided, which has two adherends 14 and 15, which are substantially disposed at a right angle to each other. In the embodiment of Figure 9, the adherend 14 is disposed at the inside of the covering wall 9 and the adherend 15 is disposed at a transition portion 16 between the end wall 6 and the covering wall 9. In this case, the transition portion 16 is formed as a thickened wall section of the end wall 6.

[0030] In the embodiment according to Figure 10, the adherend 14 is again disposed at the inside of the covering wall 9, and the adherend 15 is disposed at a web 21, which extends at a right angle in relation to the adherend 14 and is integrally connected to the upper end area of the end wall 6.

[0031] In Figure 11, an attachment device 5 is provided again in the shape of an insert connection. In this embodiment, an insert flange 11" is integrally disposed at a contact section 12 of the covering wall 6. In this case, the contact section 12 is disposed in a transition area 13 between the end wall 6 and the covering wall 9.

[0032] In the embodiment of Figure 12, the attachment device 5 is formed as an insert connection as well. In this case, an insert flange 11' is provided, which is integrally disposed at the inside of the covering wall 6, in the central area thereof. As clearly revealed in Figure 12, the insert flange 11' projects into the inner chamber 10 and thus can be brought into engagement with an engagement opening 22, illustrated by a broken line in Figure 12.

**[0033] List of reference numerals**

- |              |                    |
|--------------|--------------------|
| 1            | end cap            |
| 2            | housing            |
| 3            | door closer        |
| 4            | cap housing        |
| 5, 5'        | attachment device  |
| 6            | end wall           |
| 7, 8         | lateral walls      |
| 9            | covering wall      |
| 10           | inner chamber      |
| 11, 11', 11" | insert flange      |
| 12           | contact section    |
| 13           | transition area    |
| 14, 15       | adherend           |
| 16           | transition section |
| 17           | screw plug         |
| 18           | slot               |
| 19           | adherend           |
| 20           | counter-surface    |
| 21           | web                |
| 22           | engagement opening |
| 23           | outer contour      |
| I            | inner contour      |